CLAIMS

1. Use of a hindered amine light stabiliser as an additive in a thermoplastic moulding composition comprising polyethylene terephthalate and an acetaldehyde scavenger for reducing the degree of discolouration and/or increasing the degree of light transmission of a moulded article formed from the composition.

2. Use according to claim 1 wherein the moulding composition is subjected to a solid stating procedure after addition of the hindered amine light stabiliser and before formation of the moulded article.

3. Use according to claim 1 or claim 2 wherein the moulding composition is a recyclate.

4. Use of a hindered amine light stabiliser as an additive in a thermoplastic moulding composition comprising polyethylene terephthalate and an acetaldehyde scavenger for, synergistically with the acetaldehyde scavenger, reducing the acetaldehyde content of a moulded article formed from the composition.

5. Use according to any preceding claim, wherein the polyethylene terephthalate is coloured.

6. Use according to any preceding claim, wherein the polyethylene terephthalate is a blue colour.

7. A method of increasing the degree of light transmission after moulding of a polyethylene terephthalate moulding composition comprising an acetaldehyde scavenger, the method comprising including a hindered amine light stabiliser as an additive in the moulding composition.

8. A use or a method according to any of claims 1 to 3 or 7, wherein an increase in the degree of light transmission is confirmed by comparing the % transmission (at 450nm and/or 550nm) after moulding a said moulding composition which includes a said hindered amine light stabiliser as a said additive, to a moulding composition which is equivalent in all respects except that it does not include a said hindered amine light stabiliser.

9. A thermoplastic polymer additive composition for addition to a thermoplastic moulding composition comprising polyethylene terephthalate, said additive composition comprising at least one hindered amine light stabiliser and at least one acetaldehyde scavenger.

10. A composition according to claim 9, wherein the sum of the wt% of acetaldehyde scavengers and hindered amine light stabilisers in said composition is less than 50wt%.

11. A composition according to claim 9 or claim 10, wherein said composition comprises: a liquid wherein the sum of the wt% of acetaldehyde scavengers and hindered amine light stabilisers in the liquid is in the range 20 to 50wt%; or a solid masterbatch wherein the sum of the wt% of acetaldehyde scavengers and hindered amine light stabilisers is in the range 8 to 30wt%.

12. A method of making a composition according to any of claims 9 to 11, the method comprising:

- selecting an acetaldehyde scavenger;

- selecting a hindered amine light stabiliser;
- mixing acetaldehyde scavenger and hindered amine light stabiliser to produce a said composition.

13. A method according to claim 12, further comprising: contacting the acetaldehyde scavenger and/or hindered amine light stabiliser with polyethylene terephthalate.

14. A method according to claim 12 or claim 13, wherein a masterbatch comprising acetaldehyde scavenger, hindered amine light stabiliser and polyethylene terephthalate is prepared.

15. A method according to claim 12 or claim 13, wherein a liquid for mixing with polyethylene terephthalate is prepared.

16. A method of making a moulded article from a colourless or substantially colourless thermoplastic moulding composition which comprises:

(a) providing a colourless or substantially colourless thermoplastic moulding composition comprising polyethylene terephthalate;

(b) admixing with the thermoplastic moulding composition at least one hindered amine light stabiliser and at least one acetaldehyde scavenger;

(c) heating the colourless or substantially colourless thermoplastic moulding composition; and

(d) moulding the hot colourless or substantially colourless thermoplastic moulding composition so as to form a moulded article.

17. A method of making a blow moulded bottle from a polyethylene terephthalate moulding composition which comprises:

(i) providing a colourless or substantially colourless polyethylene terephthalate moulding composition;

(ii) admixing with the polyethylene terephthalate moulding composition at least one hindered amine light stabiliser and at least one acetaldehyde scavenger;

(iii) heating the colourless or substantially colourless polyethylene terephthalate moulding composition;

(iv) extruding the hot colourless or substantially colourless polyethylene terephthalate moulding composition so as to form a bottle preform; and

(v) blow moulding the bottle preform at a blow moulding temperature so as to form a colourless or substantially colourless bottle.

18. A method of making a useful article which comprises:

(A) providing a colourless or substantially colourless thermoplastic moulding composition comprising polyethylene terephthalate;

(B) admixing with the thermoplastic moulding composition at least one hindered amine light stabiliser and at least one acetaldehyde scavenger;

(C) forming a colourless or substantially colourless moulded article by a procedure including heating the colourless or substantially colourless thermoplastic moulding composition;

(D) after use of the moulded article, subjecting the material of the moulded article to recycling steps which include subjecting the material of the

moulded article to elevated temperature conditions for a prolonged period of time; and

(E) re-forming the thus treated material into a useful article.

19. A method of making a useful article which comprises:

i. providing a colourless or substantially colourless thermoplastic moulding composition comprising polyethylene terephthalate and an acetaldehyde scavenger as an additive;

ii. forming a colourless or substantially colourless moulded article by a procedure including heating the colourless or substantially colourless thermoplastic moulding composition;

iii. after use of the moulded article, admixing with the material of the moulded article at least one hindered amine light stabiliser;

iv. subjecting the resulting material of the moulded article to recycling steps which include subjecting the material of the moulded article to elevated temperature conditions for a prolonged period of time; and

v. re-forming the thus treated material into a useful article.

20. A method of making an article from a colourless or substantially colourless thermoplastic moulding composition that comprises:

a) providing a colourless or substantially colourless thermoplastic moulding composition comprising recycled colourless or substantially colourless thermoplastic material, said recycled colourless or substantially colourless thermoplastic material containing at least one acetaldehyde scavenger;

b) admixing with the thermoplastic moulding composition an additive comprising a hindered amine light stabiliser; and

c) extruding the resultant composition to form said article.

21. A method according to any of claims 16 to 20, wherein the colourless or substantially colourless moulding composition is replaced with a coloured moulding composition.

22. A method according to claim 21, wherein the coloured moulding composition is blue.

23. A product comprising polyethylene terephthalate, hindered amine light stabiliser and acetaldehyde scavenger.

24. A product according to claim 23, wherein said product comprises recycled polyethylene terephthalate.

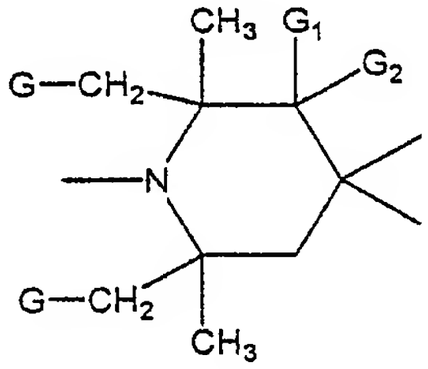
25. A product according to claim 23 or claim 24, wherein said product is in the form of pellets or granules.

26. A product according to claim 23 or claim 24, wherein said product comprises a moulded article.

27. A product according to claim 23 or claim 24, wherein said product comprises a preform for a receptacle, for example bottle.

28. A product according to claim 23 or claim 24, wherein said product comprises a bottle.

29. A use, composition, method or product according to any preceding claim, wherein said hindered amine light stabiliser includes a moiety I or II



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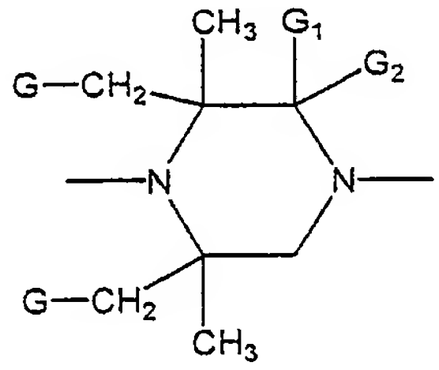

(II)

wherein

G is hydrogen or methyl, and

G_1 and G_2 are hydrogen, methyl or together are oxygen.

30. A use, composition method or product according to any preceding claim, wherein said hindered amine light stabiliser is selected from compounds III to XVIIII in Figures 1 to 4.

31. A use, composition method or product according to any preceding claim, wherein said hindered amine light stabiliser is selected from poly[6-[(1,1,3,3-tetramethylbutyl)amino]1,3,5-triazine-2,4-diyl]-[(2,2,6,6-tetramethyl-4-piperidyl)-imino]hexamethylene[(2,2,6,6-tetramethyl-4-piperidyl)imino], poly-[[6-[N-

(2,2,6,6-tetramethyl-4-piperidinyl)-n-butylamino]-1,3,5-triazine-2,4-diyl][(2,2,6,6-tetramethyl-4-piperidinyl)imino]-1,6-hexanediyl[2,2,6,6-tetramethyl-4piperidinyl)imino]]-alpha-[N,N,N',N'-tetrabutyl-N''-(2,2,6,6-tetramethyl-4-piperidinyl)-N''-[2,2,6,6-tetramethyl-4-piperidinylamino)-hexyl]-[1,3,5-triazine-2,4,6-triamine]omega-N,N,N',N'-tetrabutyl-1,3,5-triazine-2,4-diamine, Compound IV in Figure 1, sebacic acid, bis(2,2,6,6-tetramethyl-4-piperidyl)ester, and poly(6-morpholino-1,3,5,-triazine-2,4,-diyl)[(2,2,6,6-tetramethyl-4-piperidyl)imino]-hexamethylene-[(2,2,6,6-tetramethyl-4-piperidyl)-imino].

32. A use, composition, method or product according to any preceding claim, wherein said hindered amine light stabiliser includes: a moiety I described in claim 29, wherein each G represents a hydrogen atom and G_1 and G_2 represent hydrogen atoms; a $-(CH_2CH_2)_p-$ moiety where p is in the range 1 to 10, wherein said stabiliser is an oligomer.

33. A use, composition, method or product according to any preceding claim, wherein said hindered amine light stabiliser comprises structure VII as shown in Figure 2.

34. A use, composition, method or product according to any preceding claim, wherein said acetaldehyde scavenger includes one or more nitrogen atoms.

35. A use, composition, method or product according to any preceding claim, wherein said acetaldehyde scavenger includes a primary or secondary amine moiety.

36. A use, composition, method or product according to any preceding claim, wherein said acetaldehyde scavenger includes $-NH_2$, $-CONH_2$ and a substituted phenyl moiety.

37. A use, composition, method or product according to any preceding claim, wherein said acetaldehyde scavenger comprises: a polyamide selected from the group consisting of low molecular weight partially aromatic polyamides having a number average molecular weight of less than 15,000, low molecular weight aliphatic polyamides having a number average molecular weight of less than 7,000, and combinations thereof;

or an organic additive compound comprising at least two component molecular fragments, each component molecular fragment comprising at least two hydrogen substituted heteroatoms bonded to carbons of the component molecular fragment, the component molecular fragments each being reactive with acetaldehyde to form water and a resulting organic molecular fragment comprising an unbridged 5- or 6- membered ring including the at least two heteroatoms;

or Anthranilamide, 1,8-diaminonaphalene, Allantoin, 3,4-diaminobenzoic acid, Malonamide, Salicylanilide, 6-amino-1,3-dimethyluracil (DMU), 6-Aminoisocytosine, 6-Aminouracil, 6-Amino-1-methyluracil.

38. A use, composition, method or product according to any preceding claim, wherein said acetaldehyde scavenger is selected from anthranilamide and 1,6-bis (2-aminobenzamidoyl hexane).

39. A use, composition, method or product according to any preceding claim, wherein the ratio of the weight of said acetaldehyde scavengers to the weight of hindered amine light stabilisers is at least 2 and less than 30.

40. A use, composition, method or product according to claim 39, wherein the ratio is in the range 3 to 8.

41. A use, composition, method or product according to any preceding claim, wherein in a moulding composition comprising polyethylene terephthalate, the amount of acetaldehyde scavenger in the composition is in the range 0.01 to 0.05wt% and the amount of hindered amine light stabiliser is in the range 0.002 to 0.040wt%.

42. A use, composition, method or product according to claim 41, wherein said moulding composition includes at least 95wt% of polyethylene terephthalate.